CALIFORNIA FARMLAND CONVERSION REPORT 2008-2010

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California Department of Conservation
Division of Land Resource Protection (DLRP)
Farmland Mapping and Monitoring Program (FMMP)

Text Only Edition

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Executive Summary, 2008-2010

URBANIZATION DECREASED SHARPLY, AND IRRIGATED FARMLAND LOSSES WERE LOWER THAN THE RECORD 2008 LEVELS. LAND IDLING IN THE SOUTHERN SAN JOAQUIN VALLEY WAS THE LARGEST CONTRIBUTOR TO FARMLAND CONVERSION.

Irrigated farmland in California decreased by nearly 263 square miles (168,039 acres) between 2008 and 2010 as documented by the Farmland Mapping and Monitoring Program (FMMP). The highest-quality agricultural soils, known as Prime Farmland, comprised 61 percent of the loss (102,554 acres). Urban development, which totaled 44,504 acres, decreased by 39 percent relative to the 2006-08 period. The 2010 urban land increase was the lowest recorded in the program's history, reflecting impacts of the recent recession.

The FMMP biennial mapping survey covers approximately 98 percent of the privately owned land in the state (49.1 million acres) in 49 counties. Land use information is gathered using aerial imagery and land management data, which is combined with soil quality data in a geographic information system (GIS) to produce maps and statistics. The earliest data for most counties is from 1984.

Urban Development

Of the nearly 70 square miles of new Urban and Built-up land in the state, 44 percent occurred in the Southern California region (19,702 acres). Five out of the top ten urbanizing counties were in Southern California. Riverside County accounted for 13 percent of the state total (5,874 acres). San Diego and Los Angeles each added more than 4,000 acres to their urban totals. The San Joaquin Valley comprised 34 percent of statewide urban increases (15,132 acres). The urban footprints of Kern, Kings, and Fresno counties each expanded by 3,000 acres or more. The San Francisco Bay and Sacramento Valley regions were in third and fourth ranks in terms of urbanization, at 3,735 and 2,973 acres, respectively.

Statewide, irrigated farmland was the source of 11,104 acres or 25 percent of all new urban land. Prime Farmland was impacted at more than twice the rate of lesser quality soils (7,807 acres and 3,297 acres, respectively). Another 30 percent of new urban land came from dryland farming and grazing uses, some of which may have been idled in anticipation of development. The remaining 45 percent was derived from natural vegetation or vacant lands.

Keeping with historic precedent, the San Joaquin Valley region had the largest proportion of direct irrigated land to urban land conversion (47 percent of its total urban increase). Kern and Tulare counties led in farmland urbanization, at more than 1,600 acres each. Direct irrigated farmland to urban conversions comprised 25 percent of total new urban for both the Sacramento Valley and San Joaquin Valley regions.

Housing and commercial development projects were significantly scaled back in size compared with prior mapping cycles. The largest single development statewide, at about 190 acres, was the Sun City Shadow Hills community in Indio (Riverside County). Community infrastructure such as water control, waste, and energy facilities also expanded. Examples included a single water treatment facility covering 400 acres near Lancaster (Los Angeles County), more than 3,500 acres of water recharge basins in the southern San Joaquin Valley, and a number of small scale renewable energy and landfill facilities in Southern California and the San Joaquin Valley. Federal prison construction in Fresno County added 135 acres to the urban totals.

Agricultural Trends

While urbanization is an important component of agricultural land conversion, economic and resource availability factors also lead to more intensive farming or cessation of land from irrigated uses. Conversion from grasslands to orchards, primarily almonds, was the most widespread form of intensification in 2010. New almonds, vineyards, and row crop plantings were centered in the Sierra foothills of the northern San Joaquin Valley, resulting in expansions of irrigated farmland exceeding 5,000 acres in each of the counties ranging from San Joaquin in the north to Fresno in the south. The Sacramento Valley region was more noted for conversions to high density olive orchards, while vineyards were the primary reason for central coast irrigated land expansions. Riverside County was the only county in the Southern California area with notable new irrigated land acreage, mostly in the form of nurseries and vineyards. Sixty-eight percent of the land brought into irrigated uses in 2010 did not meet Prime Farmland criteria.

Land was removed from irrigated categories—to uses aside from urban—at a rate 3 percent lower than the prior update (260,412 acres in 2008 and 252,473 acres in 2010). Land idling and reversion to dry farming were responsible for more than 84 percent of this type of conversion. The remaining 16 percent were conversions to Other Land, which includes miscellaneous uses such as wetland restoration, aggregate mining, abandoned development projects, and rural residences.

The southern San Joaquin Valley and counties in the Sacramento-San Joaquin Delta were most impacted by land idling. Five counties had 10,000 or more acres of this conversion type: Fresno, Kings, Kern, Sacramento, and San Joaquin. Fresno County's reclassification of more than 34,000 acres led all counties. Most of the conversions occurred on the west side of the San Joaquin Valley in association with ongoing drought and salinity related land retirement. Since 2006, water deliveries to federal and state water districts decreased to between 35 percent and 60 percent of their contracted allocations—including a 10 percent limit for federal contractors in calendar year 2009. In the Delta counties of Sacramento and San Joaquin, environmental restoration and anticipated urban development played a larger role in this conversion type. The cessation of irrigation resulted in land being reclassified to Grazing Land or Farmland of Local Importance, which could be reversed if environmental factors change. Another factor leading to conversions away from irrigated uses was dairy expansion. This occurred predominantly in Kings County, with more than 1,100 acres of new dairy facilities added to the county's Farmland of Local Importance total.

Conversion data from 26 years of Important Farmland mapping indicates that for every five acres leaving agricultural use, four convert to Urban Land and one converts to Other Land. This update cycle, conversions to Other Land declined by 2 percent relative to the 2008 period (from 39,959 acres to 39,208 acres). San Joaquin and Sacramento Valley counties accounted for 37 percent and 32 percent of the total, respectively. Large examples of this conversion type included wetland expansions in Fresno and Sutter counties (1,700 and 1,100 acres, respectively). Low density rural residential expansion, totaling just over 5,100 acres in the San Joaquin Valley, was significantly less than the 13,000 acre increase during the 2008 update.

Program Improvements and Challenges

Non-GIS users can now access Important Farmland data via the California Important Farmland Finder[1] (CIFF). The CIFF application was developed by the Department of Conservation's Enterprise Technology Services Division. It provides a number of location search options, as well as the ability to place points, digitize areas of interest, create buffers, and obtain Important Farmland acreages.

Despite the depth of the recent recession, planners at the state and local level have been actively working toward new energy, transportation, and water infrastructure to support the next generation of Californians. Interest in Important Farmland data increased as proposals for solar projects came forward. FMMP analysts responded to requests for evaluation of additional chemical, physical, or water-related data to determine potential productivity limitations at these locations. FMMP provided technical assistance to lead agencies and conducted evaluations of these proposals through the California Environmental Quality Act (CEQA) process on behalf of the Department.

Net Change

Statewide, irrigated farmland decreased by 168,039 acres in 2010, an amount 17 percent lower than the record decline reported in 2008 (203,011 acres). The San Joaquin Valley's nearly 85,000 acre irrigated land decrease accounted for just over 50 percent of the statewide total, while the Sacramento Valley region accounted for 20 percent of the total. Land idling was the single largest reason for land being removed from irrigated categories.

Additional factors contribute to irrigated farmland decreases, such as urbanization, ecological restoration, and gravel mining. While urbanization remained the dominant driver of farmland conversion in Southern California during the 2010 update, land idling and ecological restoration had greater impact on irrigated totals than urbanization in all other regions.

Countering the net loss of irrigated farmland in most counties, there were a few locations with net irrigated land increases in 2010. These were clustered in the eastern foothills of the northern San Joaquin Valley, with Merced County's 5,964 acre increase leading that of adjacent Stanislaus and Madera counties (3,455 acres and 1,181 acres, respectively). These increases were dominated by blocks of orchards or vineyards, the largest nearly four square miles in size. Coastal winegrowing counties and the new olive groves of Tehama County comprised the remaining counties with net positive irrigated totals.

1984-2010 Net Land Use Change

During the 13 biennial reporting cycles since FMMP was established, nearly 1.4 million acres of agricultural land in California were converted to nonagricultural purposes. This represents an area larger in size than Merced County, or a rate of nearly one square mile every four days. Nearly 80 percent of this land was urbanized, and 19 percent became one of the miscellaneous land uses grouped into the Other Land category. New water bodies represent the remaining 1 percent of farmland conversion.

[1] http://maps.conservation.ca.gov/ciff/

The largest losses in agricultural land have been from the Prime Farmland category (662,297 acres). The only agricultural category to increase over the 26 year period has been Unique Farmland (15,766 acres) due to expansion of high value crops—mostly orchards and vineyards—on hilly terrain.

FMMP historic data also illustrates trends in agricultural and urban conversion since 1984. Urbanization declined in the periods of recession—the early-to-mid-1990's and the late 2000's. Irrigated farmland acreage decreased in almost every update cycle. Dryland farming and grazing have frequently moved in the opposite direction of irrigated land, as multi-year hydrologic and economic factors influence how much land growers put into production.

As 2012 mapping proceeds, the development of infrastructure to support the next generation of Californians is anticipated to impact its agricultural land resources. The Department of Conservation will continue to support informed planning decisions with timely and accurate agricultural land resource data, capturing these trends as they evolve.

Chapter 1: The Farmland Mapping and Monitoring Program

DOCUMENTING CHANGES IN AGRICULTURAL LAND USE SINCE 1984

The goal of the Farmland Mapping and Monitoring Program (FMMP) is to provide consistent, timely, and accurate data to decision makers for use in assessing agricultural land resource status in California. The extent of urbanization since mapping was initiated is illustrated in yellow for the Bakersfield area of Kern County (Figure 1).

Approximately 98 percent of the privately owned land in the state (49.1 million acres) was mapped during the 2010 update cycle by FMMP. The survey area is shown on page 7 (Figure 2). Each map is updated every two years, providing an archive to track land use change over time.

Using a geographic information system (GIS), aerial imagery, comments from local agencies, and other information, FMMP combines soil quality data and current land use information to produce Important Farmland Maps. This program is mandated under Government Code Section 65570, and funded through the state's Soil Conservation Fund. This fund receives revenues from Land Conservation Act (commonly referred to as the Williamson Act) contract cancellation fees.

Advances in technology have supported significant FMMP data improvements over the years. Most recently, the California Important Farmland Finder allows users to locate their area of interest on mobile devices and desktops using many different search features. This allows use of the data in the field, complementing the Program's printed maps, PDF maps, statistics, field reports, and GIS data. The maps and data are used in environmental studies to assess the impacts of proposed development on agricultural and open space land. A number of jurisdictions base their agricultural land mitigation requirements on the amounts of Important Farmland affected by development project conversions. FMMP data is also used in urbanization and environmental modeling, and comparative land cover studies.

In addition, only land that is classified in one of the four main agricultural categories on Important Farmland Maps is eligible for enrollment in Land Conservation Act Farmland Security Zone (FSZ) contracts. Under FSZ contracts, landowners receive substantial property tax benefits in exchange for their commitment to keep their land in agricultural use for 20-year periods.

This is the thirteenth Farmland Conversion Report produced by the FMMP, the current report covering the 2008 to 2010 period.

Important Farmland Map Categories

FMMP's study area coincides with boundaries of U.S. Department of Agriculture (USDA) modern soil surveys. Technical soil ratings and current land use information are combined to determine the appropriate map category. The minimum land use mapping unit for all categories is 10 acres unless otherwise noted. Soil units as small as one acre are maintained to most accurately represent the original USDA data.

Prime Farmland has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to

produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance is similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Unique Farmland consists of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

Farmland of Local Importance is land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. The definitions for this category are detailed in Appendix E of this report.

Grazing Land is land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities.

Urban and Built-up Land is occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, prisons, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures.

Water is defined as perennial water bodies with an extent of at least 40 acres.

Other Land is land not included in any other mapping category. Common examples include low density rural developments, vegetative and riparian areas not suitable for livestock grazing, confined animal agriculture facilities, strip mines, borrow pits, and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land. More detailed data on these uses is available in counties containing the Rural Land Use Mapping categories.

Rural Land Use Mapping Categories

The Rural Land Mapping project provides more map and statistical detail than standard Important Farmland Map products by classifying Other Land into five subcategories, as described on page 7. This data is only available in the eight San Joaquin Valley counties and Mendocino County at this time; please see page 23 and the Appendix D tables.

Rural Residential Land includes residential areas of one to five structures per ten acres.

Semi-Agricultural and Rural Commercial includes farmsteads, small packing sheds, unpaved parking areas, composting facilities, firewood lots, and campgrounds.

Vacant or Disturbed Land consists of open field areas that do not qualify for an agricultural category, mineral and oil extraction areas, and rural freeway interchanges.

Confined Animal Agriculture includes aquaculture, dairies, feedlots, and poultry facilities.

Nonagricultural and Natural Vegetation covers heavily wooded, rocky or barren areas, riparian and wetland areas, grassland areas that do not qualify for Grazing Land due to their size or land management restrictions, small water bodies, and recreational water ski lakes. Constructed wetlands are also included in this category. The Rural Land classes are not designed for interpretation as habitat. Geographic data on the extent of habitat for various species may be available from other state and federal entities.

Optional Designation

Land Committed to Nonagricultural Use is defined as existing farmland, grazing land, and vacant areas that have a permanent commitment for development. This optional designation allows local governments to provide detail on the nature of changes expected to occur in the future. It is available both statistically and as an overlay to the Important Farmland Map.

Survey Area Coverage

In Figure 2, the 'Irrigated Farmland' area includes the Prime Farmland, Farmland of Statewide Importance, and Unique Farmland categories. The 'Dryland Farming and Grazing Land' designation includes the Farmland of Local Importance and Grazing Land categories.

Locations shown as 'Out of Survey Area' may be added in the future, while those indicated as 'Local, State, and Federal Owned Land' are not planned for incorporation. Examples of government-owned land include National Parks and Forests and Bureau of Land Management property. Please note that small areas of public land are included within the Important Farmland survey area—generally appearing as 'Other Land' on the map.

Chapter 2: 2010 Improvements and Challenges

A WEB-BASED, SEARCHABLE PLATFORM AND INFRASTRUCTURE SITE ANALYSES HIGHLIGHT NEW TRENDS

Each update cycle provides the opportunity to make improvements to the Important Farmland data, in order to achieve increased accuracy, process efficiency, or better reporting capabilities. The 2010 mapping cycle posed unique challenges because it coincided with the depth of California's recent recession. Departmental technology support enabled development of more easily accessible Important Farmland data, while FMMP staff focused on evaluating farmland in a larger perspective, in response to changing land use trends.

California Important Farmland Finder (CIFF)

http://maps.conservation.ca.gov/ciff/

The CIFF application was developed by the Department's Enterprise Technology Services Division, as a way to facilitate user access to FMMP data. Searches can be conducted by county, address, Zip Code, lat/long coordinates, or by using the geolocate function on mobile devices. Users may place points, digitize areas of interest, and obtain Important Farmland acreages.

A one mile buffer is available to determine Important Farmland status (Figure 3). This tool provides land sellers and agents the data they need to comply with right to farm real estate disclosure legislation.[2] Data can also be downloaded from CIFF in GIS format.

Infrastructure for the Next Generation of Californians

Planners at the state and local level are actively working toward development of new energy, transportation, and water infrastructure to support the next generation of Californians. The largest impact of infrastructure projects during the 2010 update was associated with renewable energy generation. Electric utility companies in California are required to have 33 percent of their retail sales derived from renewable sources by 2020.[3] Agricultural land is attractive for siting photovoltaic solar facilities due to its level terrain, existing land disturbance, decreased likelihood of hosting species of concern, and proximity to transmission lines or substations. The goals of maintaining a vibrant agricultural economy and resource base while meeting the renewable generation standard are of concern to many decision makers. Interest in Important Farmland data increased as proposals for solar projects came forward. FMMP analysts responded to requests for evaluation of additional chemical, physical, or water-related data to determine potential productivity limitations at these locations.

Additional projects expected to have a large footprint on agriculture in the next few years include California High Speed Rail and the Bay-Delta Conservation Plan. FMMP provided technical assistance to lead agencies and conducted evaluations of these proposals through the California Environmental Quality Act (CEQA) process on behalf of the Department.

[2] AB 2881 (Wolk, Chapter 686, Statutes of 2009).
[3] Public Resources Code, starting with Section 25740.

Chapter 3: Understanding the Data

LOCATING AND INTERPRETING THE CALIFORNIA FARMLAND CONVERSION REPORT'S TABULAR DATA AND GRAPHICS.

Important Farmland information is developed on an individual county basis, taking two years to map the 49.1 million acre survey area. This report begins with each county's information, compiling it in various ways to produce the summary and analysis in Chapter 4.

Source Data: County Conversion Tables - Appendix A

These tables include acreage tallies and conversion statistics for individual counties.

Statewide Conversion – Chapter 4, Table 3

This table summarizes material from all three sections of the Appendix A tables and has the same structure as the individual county tables.

2008 and 2010 County Acreage Tallies – Appendix B

Values for the individual years (Tables B-1 and B-2) are extracted from Part I of the tables in Appendix A. These tables also indicate the proportion of each county that lies within the FMMP survey area—mapping typically ends at the boundaries of National Forests, for example. Table B-3 shows this same information for 2010, grouped by region.

County and Regional Conversion Summaries – Appendix C

The counties are grouped into geographic regions as seen in Figure 5. Much of the analysis in Chapter 4 is based on the data in Appendix C.

Table C-1classifies sources of new urban land for the period, by county and region.

Table C-2 identifies conversions in or out of agriculture aside from urbanization, capturing the ebb and flow of agricultural land use change over time.

Table C-3 Documents net agricultural change from all factors, grouped by region and ranked by acreage.

Rural Land Use Mapping Tables – Appendix D

Contains data on changes associated with a more detailed subdivision of the Other Land category. Data is available for nine project counties at this time.

Simplifying Assumptions

In order to conduct comparative analysis, certain simplifying assumptions have been made. For example, Unique Farmland is considered to be an irrigated farmland category, even though a small percentage of land within the Unique Farmland category supports high value nonirrigated crops, such as some coastal vineyards. Conversely, Farmland of Local Importance is considered to be a nonirrigated category although it also supports some irrigated pasture on lower-quality soils.

Statistical Notes

As changes are made to the land use data, there are instances where residual pieces of land are left that are smaller than the 10- or 40-acre minimum land use mapping unit. In order to maintain map unit consistency, these small units are absorbed into the most appropriate adjacent land use type. This process may result in small shifts among categories that appear anomalous in the conversion statistics—such as urban to agriculture or Prime Farmland to Farmland of Statewide Importance.

Once land use and digital soil data are merged to create the Important Farmland data, units of less than 1.0 acre are reclassified into the next most appropriate category to optimize the data files. Tabular data is reported in whole numbers; small variations in category totals may result from rounding to whole numbers.

Particularly large or anomalous changes are footnoted at the bottom of each table. Additional detail is available in the field analyst report produced for each county.

Chapter 4: Land Use Conversion, 2008-2010

URBANIZATION RATES DECREASED SHARPLY, AND IRRIGATED FARMLAND LOSSES DECREASED TO 2004-2006 LEVELS. LAND IDLING IN THE SOUTHERN SAN JOAQUIN VALLEY WAS THE LARGEST CONTRIBUTOR TO FARMLAND LOSS.

California's agricultural landscape continues to evolve in conjunction with economic and resource-related factors. Between 2008 and 2010, urban development impacted 44,504 acres, 39 percent fewer than the 72,548 acres urbanized between 2006 and 2008. Approximately 25 percent of urban conversions were derived from irrigated farmland, and 30 percent from dryland farming and grazing land. The statewide 2008-2010 conversion summary, Table 3, is located on page 15. Comparative changes in important farmland categories for the two most recent update cycles are shown in Figure 6 below.

A total of 168,039 acres were removed from irrigated land uses during the 2010 update; a 17 percent decrease compared with the 203,011 acre irrigated land loss posted in 2008. These totals include the impact of all factors—urbanization, land idling, habitat conversion, and low density rural development. As was the case during the 2006-08 mapping cycle, conversions from irrigated land to Grazing Land and Farmland of Local Importance exceeded urban land conversions. The location of idled lands likely indicates water availability issues in parts of the state, and is discussed later in this chapter.

Urbanization

2008-2010 Source Data: Appendix Table C-1

Southern California and San Joaquin Valley counties comprised the top ten urbanizing list during the 2010 Important Farmland update, as Riverside County continued to lead in overall urbanization (Table 1). Four other counties in the region remained in the top ranks: San Diego, Los Angeles, San Bernardino, and Orange. In total, Southern California accommodated 44 percent of the State's urbanization between 2008 and 2010. Five of the San Joaquin Valley counties completed 2010's top ten list. Bay Area, Foothill, and Sacramento Valley counties were absent from the top urbanizing list in 2010. Most counties had lower urbanization totals than during the prior update, many decreasing by significant amounts.

Although only two regions appeared in the top ten list, overall urbanization was slightly more dispersed during the 2010 update—while the top ten counties hosted 74 percent of statewide urban growth during 2008, the figure was 71 percent during the 2010 update.

Regional rankings were again dominated by Southern California and the San Joaquin Valley (Table 2). Although both regions showed a decline in urbanization relative to the 2006-08 period, Southern California's decrease was larger—dropping by 45 percent, compared to the 22 percent drop for the San Joaquin Valley. The Sierra Foothill region experienced the largest drop in urbanization, 92 percent, due to a near halt of development in Placer County. The increased rate of development in the North State region was primarily due to recreational facilities, including golf course resorts in Lake and Modoc counties.[4] The Central Coast region's growth rate was nearly identical in both updates.

[4] Langtry Farms and Vineyard private golf course in Lake County, and an expansion of Likely Place RV and Golf Resort in Modoc County.

Housing and commercial developments were the most common new urban land uses. New planned developments consisted of single family homes along with schools, parks, and neighborhood commercial uses. The scale of projects was reduced compared to prior updates. While projects of 400 to 600 acres were common earlier in the decade, the largest 2010 example, 190 acres, occurred in Indio, Riverside County.[5] Golf course construction was also significantly scaled back, with FMMP field analyst reports citing at most one or two facilities per county. The peak of golf course development occurred between 2000 and 2002, as large percentages of new urban land in Riverside and San Diego counties (25 percent and 14 percent, respectively) consisted of golf-related communities.[6]

Schools, parks, and shopping centers individually occupy relatively small footprints but occurred frequently and in many locations. The largest single school example was an 80 acre campus in San Bernardino County.[7] Distribution centers and industrial developments were much less frequent during the 2010 update. The most notable change was approximately 110 acres of airport-related construction in San Bernardino County.[8]

Infrastructure development was dominated by water control, waste, and energy services. Water treatment plants, storage ponds, groundwater recharge ponds, and evaporation basins were most commonly constructed in central and southern California. Such facilities totaled more than 2,000 acres in Kings County, more than 1,500 acres in Kern County, and 400 acres for a single water treatment facility near the city of Lancaster, Los Angeles County. Landfill and transfer yard expansions were few in number and size this update. Scattered, ten-acre expansions occurred around the state, and the largest single example, 50 acres, occurred in San Joaquin County.[9] Photovoltaic solar facilities of 50 acres or more occurred in Fresno and Riverside counties. At 170 acres, the largest solar project constructed was in Blythe, Riverside County. Additional solar facilities were breaking ground at the end of the 2010 update. These projects will be documented as conversions in the 2012 edition of the maps.

Urbanization's impact on irrigated farmland was significantly lower during the 2010 mapping cycle (Table 4 and Appendix Table C-1). Kern County hosted approximately 300 acres of new homes on former farmland in the Bakersfield area, while other jurisdictions converted between 10 and 50 acres each for residential and commercial purposes. New water control facilities occupied nearly 1,000 acres of irrigated land in Kern County, in the Calders Corner, Pumpkin Center, Strand Oil Field, and Rosamond areas.

In second ranking Tulare County, the Ridge Creek Dinuba Golf Course and Visalia Riverway Sports Park were notable additions to the urban footprint. Visalia, Tulare, and Porterville each added a mix of residential, commercial, and community facilities. Fresno County's notable conversions of irrigated farmland to urban uses included 135 acres at the Mendota Federal Correction Facility,[10] and nearly 300 acres each for new home development in the cities of Clovis and Fresno. Tulare County was notable as having the highest proportion of urban development on Prime Farmland (72 percent) statewide, followed by Monterey County (69 percent).

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[5] Sun City Shadow Hills Community.
[6] California Farmland Conversion Report 2000-2002.
[7] Oak Hills High School in Hesperia.
[8] Two large structures at the Southern California Logistics Center, Victorville.
[9] Austin Road Landfill in San Joaquin County.
[10] http://www.bop.gov/locations/institutions/men/index.jsp

All told, 33 percent of new urban land in the San Joaquin Valley came from Prime Farmland, and an additional 16 percent came from Farmland of Statewide Importance and Unique Farmland during the 2008-10 period. These statistics continue a trend in which Prime and irrigated farmland is being impacted at lower proportions compared to prior updates. As recently as 2002-04,[11] 48 percent of urbanization in the region was derived from Prime Farmland, and 13 percent came from Farmland of Statewide Importance and Unique Farmland. However, the proportion of new urban lands in the Valley located on idled farmland and grazing land has increased, from 18 percent during the 2008 cycle to 20 percent in the 2010 update. This may reflect a recession-induced lag time in the project development process.

Statewide, 25 percent of urbanization took place on irrigated farmland (18 percent Prime Farmland, 7 percent on lesser quality soils). Another 30 percent came from dryland farming and grazing uses, some of which may have been idled in anticipation of development. The relative location and type of land converted to urban uses is shown graphically in Figure 7.

Other Changes Affecting Agricultural Land

2008-2010 Source Data: Appendix Table C-2

A major goal of the Important Farmland mapping project is to track long-term trends in agricultural land resource use. The biennial reporting of these trends to the Legislature is statutorily mandated under Government Code Section 65570. While urbanization is an important component, economic and resource availability factors also lead to lands being more intensively farmed or being taken out of irrigated use. Appendix Table C-2 documents the extent to which these factors affected the data during the 2008-10 mapping cycle.

Land is converted to irrigated agricultural use when dry pastures or natural vegetation are converted, or when idled land is brought back into production. Conversions to irrigated categories totaled 99,834 acres between 2008 and 2010, an increase of 22 percent from the prior cycle. Nearly 68 percent of the land brought into agricultural use did not meet the criteria for Prime Farmland. Throughout the history of the Program, newly irrigated land has ranged between 65 percent and 70 percent non-Prime Farmland.

San Joaquin Valley counties accounted for 51 percent of the land brought into irrigated uses (Figure 8), while the Sacramento Valley and the Central Coast comprised 15 percent and 12 percent, respectively.

Five counties had irrigated land expansions in excess of 5,000 acres: Fresno, Madera, Merced, San Joaquin, and Stanislaus (Appendix Table C-2). Many of the additions were almond orchards along the Sierra Nevada foothills in the zone between San Joaquin and Madera counties. Almond acreage has continued to expand throughout the past decade due to strong market conditions. The California Almond Board reports a statewide increase from 605,000 planted acres in the year 2000 to 805,000 acres in 2010.[12] County Agricultural Commissioner Reports document new almond plantings between 2008 and 2010 of 6,200 acres in Merced County and more than 16,000 acres in Stanislaus County.[13]

[11] California Farmland Conversion Report 2002-2004.

[12] http://www.almondboard.com/AbouttheAlmondBoard/Documents/ALM110600_Almanac2011_LR.pdf

[13] http://www.co.merced.ca.us/Archive.aspx?AMID=36 and http://www.stanag.org/crop-reports.shtm

Other crops most commonly associated with irrigated land increases include high value vineyards, walnut orchards, and vegetable crops. Vegetable crop examples from Merced County[14] include expansions in tomatoes and sweet potatoes of nearly 3,000 acres each between 2008 and 2010. Cotton is another major crop that was not popular early in the decade due to pest-related and market issues, but statewide acreage has rebounded, including a Merced County increase of more than 4,200 acres between 2008 and 2010. Annually cropped lands that were idled due to pest or market-related issues may be brought back into production under improved circumstances. These changes would contribute to irrigated land acreage increases mapped during the FMMP biennial update.

The largest irrigated land expansions in the Sacramento Valley occurred in Glenn and Tehama counties, at more than 3,400 acres each. FMMP has documented almond orchard expansion on the western side of the Sacramento Valley since the 2004 map update. During the 2010 update, olive orchards were the most notable new agricultural use. County crop reports document olive acreage increases of more than 64 percent in Glenn County and 28 percent in Tehama County between 2008 and 2010.[15] New high-density planting and mechanical harvesting systems allow orchards to reach full production in a shorter time frame while reducing labor costs. The largest olive processing facility in the United States was recently constructed in Glenn County,[16] which is likely to lead to additional orchard acreage as the market increases for the award-winning olive oil harvested from these trees.

The central coast counties of Monterey, San Luis Obispo, and Santa Barbara each had increases of more than 3,000 acres in their irrigated farmland footprint. Much of this growth was associated with vineyards and limited vegetable crop expansions. Southern California's irrigated farmland increases were largest in Riverside County, at just over 4,100 acres. Vineyard development and land devoted to nurseries were the primary increases. The Temecula, Hemet, San Jacinto, Perris, and La Quinta areas hosted most of these increases.

Land is removed from irrigated categories through urbanization, conversion to Other Land, or reclassification to a dryland agriculture class (Grazing Land and Farmland of Local Importance). Urban reclassifications were discussed at the beginning of Chapter 4.

Reclassifications to Grazing Land or Farmland of Local Importance due to land idling or long-term dryland farming decreased by 3 percent compared with the 2008 mapping cycle (Figure 10). Reclassifications of this type stood at 220,453 acres in 2008 and 213,265 acres in 2010. During both mapping cycles, the San Joaquin Valley experienced the vast majority of the long-term land idling.

Five counties had 10,000 or more acres of this conversion type: Fresno, Kings, Kern, Sacramento and San Joaquin. Fresno County's reclassification of more than 34,000 acres led all counties, representing 16 percent of the statewide total for this conversion type. Most of the conversions that occurred on the west side of the San Joaquin Valley were associated with ongoing drought and salinity-related land retirement. Deliveries of irrigation water to federal water districts dropped from 100 percent in 2006 to less than 50 percent in each of the subsequent years—including a 10 percent allocation in calendar year

[14] http://www.co.merced.ca.us/Archive.aspx?AMID=36
[15] http://westernfarmpress.com/orchard-crops/california-olive-oil-deemed-world-class-acreage-expands
[16] http://www.oliveoiltimes.com/olive-oil-business/north-america/vossen-california-olive-oil-production-will-set-a-new-record/8434

2009.[17] Similarly, State Water Project deliveries ranged between 35 percent and 60 percent between 2007 and 2010.[18]

The impact of land idling since FMMP mapping was initiated in the central and southern San Joaquin Valley is highlighted in Figure 11. Lands that were irrigated but are now classified as Grazing Land or Farmland of Local Importance are depicted in yellow. Much of this idled land lies within the Westlands Water District.

Water delivery uncertainties and other resource constraints raise the possibility of additional land retirement or conversion. As of the 2010 update, FMMP field analysts have flagged in excess of 102,000 acres in the southern San Joaquin Valley (Fresno, Kern, Kings, and Tulare counties) as being in dryland or fallow status for two update cycles. Should these conditions continue, this land will be removed from irrigated farmland categories during the 2012 map update.

Sacramento and San Joaquin counties, which lie at the confluence of the rivers sharing their names, saw more than 11,000 acres and 14,000 acres, respectively, reclassified due to long-term idling or dryland farming during the 2010 update. Locations in San Joaquin County affected by larger conversions, of 500 acres or more each, occurred in the vicinity of Lathrop, Tracy, Vernalis, and Clifton Court Forebay. These conversions may represent potential urbanization or habitat restoration, depending on location. Large Sacramento County examples with a link to potential urbanization occurred in the North Natomas section of the city of Sacramento, and near the cities of Elk Grove and Galt. Habitat-related fallowing continued on Sherman Island, site of flood control and mitigation efforts by the California Department of Water Resources.[19]

Elsewhere in the state, conversion to dryland farming categories was less extensive. Six widely dispersed counties had farmland downgrades in the 5,000 to 10,000 acre range: Imperial, Riverside, Tulare, Solano, Yolo, and Siskiyou. Factors leading to the cessation of irrigation vary based on the geography of the county. In Solano and Yolo counties, land fallowing in association with ecological restoration efforts was in evidence. Large examples occurred near the Cache Slough Restoration Project in Solano County,[20] and in the vicinity of the Davis wetlands and Liberty Island restoration projects in Yolo County.[21] In Siskiyou County, an ongoing water shortage restricts deliveries for agriculture and habitat in the Klamath Basin and Shasta Valley.[22] Tulare County's conversions reflect the same circumstances as other southern San Joaquin Valley counties. In Riverside County, land left fallow for three or more update cycles (and to a lesser degree nonirrigated grains) occurred adjacent to western Riverside cities, and sites in the Coachella and Palo Verde valleys. Imperial County's land idling was centered around the communities of Brawley, Calexico, and El Centro, as well as sites closer to the Salton Sea.

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[17] http://www.usbr.gov/mp/cvo/vungvari/water_allocations_historical.pdf
[18] http://www.water.ca.gov/swpao/deliveries.cfm
[19] http://www.water.ca.gov/floodmgmt/dsmo/ecb/maep/sherman.cfm and http://ccrm.berkeley.edu/resin/pdfs_and_other_docs/background-lit/hanson_5yr-plan.pdf
[20] http://www.water.ca.gov/deltainit/docs/6-16-08CacheSlough.pdf
[21] http://www.bizjournals.com/sacramento/news/2011/04/19/rocklin-firm-finishes-yolo-restoration.html and http://www.wildlandsinc.com/four-new-mitigation-and-conservation-banks-approved-in-california/
[22] http://www.fws.gov/refuge/tulelake/walkingwetlands.html

Reclassification of irrigated land to Other Land is less frequent but is typically more permanent in nature than land idling. This is because many of the new uses involve low density residential development, mining, ecological restoration, or similar changes.

Between 2008 and 2010, 39,208 acres statewide were reclassified from irrigated agriculture to Other Land. This was a 2 percent decrease from the prior update cycle. The San Joaquin and Sacramento Valley counties accounted for 37 percent and 32 percent of the total, respectively. The most active county for conversion to Other Land this update, at just over 4,200 acres, was Sutter. More than 1,100 acres of this change was due to flooding of former rice fields in the Butte Sink area and adjacent to the Cross Canal. Some of these parcels are associated with the Natomas Basin Conservancy mitigation land project.[23] An equally large change resulted from improvements to map alignment and detail along the Sacramento River. The new boundaries better reflect current conditions of the river channel and adjacent land than did the US Geological Survey base maps.

Six other counties had conversions to Other Land that exceeded 2,000 acres: Butte, Fresno, Kern, San Diego, San Joaquin, and Tulare. Notable changes in each county represent the spectrum of uses grouped into the miscellaneous Other Land category:

- Wetland restoration near the Gray Lodge and Llano Seco wildlife areas comprised nearly 25 percent of all conversions of this type in Butte County. In Fresno County, nearly 1,700 acres were converted from Farmland of Local Importance to Other Land in association with the Don Gragnani Wetland Reserve[24] project. This conversion constituted 80 percent of Fresno County's total acres converted to Other Land.
- Development projects that were initiated and left in a disturbed condition were notable in Kern and Tulare counties. One such example is the Kern River Raceway,[25] a property larger than 100 acres that went into foreclosure in 2010. More recently, the project was sold and is now under construction. The land will be reclassified as Urban and Built-up during the 2012 update.
- Large rural estates encroaching into agricultural areas, evidenced by increased structural density, in parts of San Diego County resulted in conversions to Other Land.
- Aggregate mining at the Teichert Aggregates, Vernalis Plant[26] expanded by approximately 330 acres in San Joaquin County.

Counties with Rural Land Mapping Enhancements

2008-2010 Source Data: Appendix D

Approximately 27 percent of the Important Farmland survey area is classified as Other Land. While urbanization has historically been the driving force in agricultural land loss, FMMP's statistics indicate that for every five acres exiting crop or grazing uses, four convert to Urban Land and one converts to Other Land. Because the Other Land category encompasses a disparate group of land uses, and conversions to Other Land are most often geographically separated from urban centers, users requested more specific information about this conversion type. A 2002 pilot project created five subcategories for Other Land: Rural Residential, Semi-Agricultural and Rural Commercial, Confined Animal Agriculture, Vacant or

[23] http://www.natomasbasin.org/

[24] www.gragnanifarms.com/wetlands

[25] http://www.bakersfieldcalifornian.com/sports/motorsports/x1526556968/New-raceway-blossoming

[26] http://www.aggman.com/granite-sets-its-sights-on-the-future/

Disturbed Land, and Nonagricultural Vegetation. The pilot effort expanded on a funds-available basis to include all eight San Joaquin Valley counties. Mendocino County was added to the FMMP survey area in 2006 upon the release of its USDA soil survey, and is also mapped using the more detailed classifications. Definitions for the Rural Land Mapping categories are shown on page 7. County-level data and summaries discussed here are located in Appendix D.

Between 2008 and 2010, expansion of Rural Land Mapping categories totaled 12,055 acres (Appendix Tables D-1 and D-2), significantly less than the acreage converted during the prior update (20,108 acres). A decrease in conversions to Rural Residential land was the largest contributor to the change, declining by more than 8,000 acres between the two update cycles. Fresno and San Joaquin counties led in this conversion type, at 1,885 and 1,244 acres, respectively. Nearly three quarters of the rural residential expansion in Fresno County occurred on nonirrigated land, primarily in the Sierra foothills. Conversely, in San Joaquin County, nearly two thirds of the conversion occurred on formerly irrigated farmland.

Expansions of the Semi-agricultural and Rural Commercial category led on a percentage basis (3.4 percent), but owing to the smaller footprint of agricultural support uses, the increase totaled less than 1,400 acres. Changes of this type were widely distributed among the nine Rural Land Use counties, and Fresno County had the most conversion of this type at 445 acres.

Confined Animal Agriculture acreage expanded by 1,951 acres, a 2.2 percent increase. Kings County's increase of 1,140 acres dominated[27]—a number of dairies were added or expanded, four of them were 100 to 200 acres in size. Conversely, in San Joaquin County, a decrease of 150 acres occurred in the Confined Animal Agriculture category during the 2010 update. A series of small dairies around the county were demolished or converted to different uses as low milk prices and high management costs pressured the dairy industry[28] into consolidation in recent years. Conversions to Confined Animal Agriculture facilities have been decreasing since a high of 2,579 acres during the 2004-06 update.

Vacant or Disturbed Land can be a category of transition. More than 9,600 acres were reclassified into the Vacant class during the 2010 update. To a large degree, these were farmed lands that were disturbed in preparation for residential subdivisions or other developments but infrastructure was not completed due to the downturn in the real estate market. Another 7,100 acres converted from Vacant to Urban (54 percent), agricultural uses (37 percent), or another Rural Land Use category (9 percent). While FMMP analysts attempt to determine the use to which disturbed land will be put using planning and other data, it is not always possible to determine the future of a site in the span of a single FMMP update cycle. This is particularly true of disturbances resulting in new agricultural uses. The long-term biennial tracking of conversion provides a time series that ultimately captures what occurs to these transitional areas.

Nonagricultural Vegetation increased by a net 1,123 acres. The Fresno County wetland reserve conversion discussed on page 22 was the largest contributor to this increase. A number of counties that would impact this conversion type—particularly in the Sacramento Valley—are not currently available in the Rural Land data format.

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[27] In Kings County, dairies are included in the County's Farmland of Local Importance category. Confined animal agriculture facilities that are not included in a county's locally-important category are classified as Other Land.
[28] http://articles.latimes.com/2013/mar/30/business/la-fi-california-dairies-20130330 and http://www.recordnet.com/apps/pbcs.dll/article?AID=/20090607/A_BIZ/906070305/-1/rss01

Net Irrigated Farmland Change
2008-2010 Source Data: Appendix table C-3

Statewide, irrigated farmland decreased by a net 168,039 acres during the 2010 update (Appendix Table C-3). This figure is 17 percent lower than the 203,011 acre net loss during 2008, and is more reflective of the 157,000 acre decrease that was reported during the 2006 update. The San Joaquin Valley accounted for just over 50 percent of the net irrigated land decrease statewide in 2010. Land idling has been a major contributing factor to irrigated land decreases in recent updates, particularly in central and southern San Joaquin Valley counties. Net irrigated land decreases in the San Joaquin Valley totaled nearly 85,000 acres during the 2010 update, while the comparable figure was 130,000 acres for 2008 and 61,000 acres for 2006.

Concurrently, statewide urbanization declined during these update cycles, from 102,010 acres in 2006, to 72,548 acres in 2008, and 44,504 acres in the 2010 cycle. Irrigated land decreases due to land idling exceeded those due to urbanization during both the 2008 and 2010 updates.

The Sacramento Valley region accounted for 20 percent of the statewide net irrigated land decreases, Southern California comprised 13 percent, and the North State region followed at 7 percent of the total. Land idling and ecological restoration had greater affects than urbanization in all but the Southern California region.

On a county basis, the predominance of land idling as a factor in conversion during the 2008 and 2010 updates is highlighted in Table 5. Southern San Joaquin Valley counties dominate the list, followed by counties that are either in proximity to the Sacramento-San Joaquin Delta (Sacramento, San Joaquin, Solano, and Yolo) or are high population growth inland counties (Riverside and San Bernardino). As discussed earlier in this report, a number of factors contribute to the changes seen in the Delta counties—ecological restoration, urbanization, gravel mining, and land idling. Imperial County had a relatively large number of land idling sites distributed throughout the Imperial and Palo Verde valleys.

Countervailing the net loss of irrigated farmland in most counties, a few locations saw net increases in their farmland totals during the 2010 update (Table 6 and Appendix Table C-3). These were clustered in the northern San Joaquin Valley: Merced, Stanislaus, and Madera counties each had net increases exceeding 1,000 acres. Merced County's 5,964 acre irrigated land increase was characterized by large plantings of orchards, vineyards, and row crops in the lower foothills of the Sierra Nevada. A similar pattern occurred in Stanislaus County (net irrigated land increase of 3,455 acres), exemplified by a single orchard development of nearly four square miles north of the City of Oakdale. Coastal winegrowing counties (Mendocino, Monterey, San Luis Obispo, and Santa Barbara) comprised the remaining counties with net positive irrigated totals.

1984-2010 Net Land Use Change

During the 13 biennial reporting cycles since FMMP was established, nearly 1.4 million acres of agricultural land in California were converted to nonagricultural purposes (Table 7). This represents an area larger in size than Merced County, or a rate of nearly one square mile every four days.

In total, 79 percent of this land was urbanized, 19 percent became one of the miscellaneous land uses grouped into the Other Land category, and just over 1 percent represents new water bodies.[29]

The largest losses from agricultural land categories have been from Prime Farmland, Farmland of Statewide Importance, and Grazing Land (662,297, 348,077, and 361,879 acres, respectively). Urbanization at the periphery of cities in California's agricultural valleys led to the loss of Prime and Statewide Farmland, while grazing losses have been more prevalent in the coastal zone and interior Southern California. Unique Farmland registered a small net increase over the 26-year period (15,766 acres) due to expansion of high value crops—mostly orchards and vineyards—on hilly terrain.

The same data, shown graphically in Figure 13 (next page), illustrates trends in agricultural and urban conversion since 1984. Urbanization declined in the periods of recession—the early-to-mid-1990's and the late 2000's. Irrigated farmland acreage has decreased in almost every update cycle, most notably since the 2004. Dryland farming and grazing have frequently moved in the opposite direction of irrigated land, as multi-year hydrologic and economic factors influence how much land growers put into production.

As 2012 mapping proceeds, the development of infrastructure to support the next generation of Californians is anticipated to impact its agricultural land resources. The Department of Conservation will continue to support informed planning decisions with timely and accurate agricultural land resource data, capturing these trends as they evolve.

[29] Water body increases included Diamond Valley Lake, Lake Sonoma, and Los Vaqueros Reservoir (Riverside, Sonoma, and Contra Costa counties, respectively) and flooding of San Joaquin Delta islands for habitat (Contra Costa and Solano counties).